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the thickness of which is only approximately given here, there yet remains an immense mass, the subdivision of which is more difficult, but would not perhaps be impossible if sufficient time were allowed.

I am unable as yet to say if these Cardiola shales extend far north and south, no exposures having been yet found. But the places above mentioned trace them through the middle of the county from south-west to north-east, a distance of seven or eight miles. Their farther extension is very little less than certain.

APPENDIX.

Since the above paper was read I have spent a few hours with Prof. I. C. White, now engaged in the survey of Huntingdon county. With his assistance I found the bed here described and most of its fossils near Huntingdon. The thickness, though shortness of time prevented measurement, seems also very nearly the same.

Note on the Genus Rensselaeria in the Hamilton Group in Perry Co. By E. W. Claypole.

(Read before the American Philosophical Society, September 21, 1883.)

The Genus Rensselaeria, Hall, was established to receive certain Brachiopods, some of which were new, and others of which had previously been known under other names. They were distinguished by their general outward form and certain peculiarities of internal structure from other Brachiopods nearly allied to them.

The Genus Rensselaeria is limited in Eastern North America to the Lower Helderberg and Oriskany groups, four of its twelve species occurring in the former and seven in the latter. One only, a small species, *R. Johanni*, Hall, has been described from the Upper Helderberg of Waterloo, Iowa. Of this Prof. Hall speaks doubtfully, referring it to this genus only on account of its external characters.

Prof. Hall informs me that he has since that time removed this species from the genus. It is, therefore, rather surprising to find well-marked specimens of Rensselaeria high up in the Hamilton group of Middle Pennsylvania. Yet the sandstone, so conspicuous a feature of this group in Perry and adjoining counties; yields, near its middle, a bed which is in some places little more than a mass of shells of a form which can scarcely, if at all, be distinguished from *R. Marylandica* of the Oriskany sandstone.

In some places this shell is found almost alone, but in others it occurs mixed with *Spirifera formosa*, or a species so like it that I cannot distinguish them. This Spirifera is the most abundant fossil in the Hamilton sandstone of the county, occurring sometimes in myriads.

The Hamilton sandstone is a peculiar deposit of sand in the midst of a vast accumulation of shales. It covers a district extending from the Blue mountain northward for about fifty miles and eastward to the neighborhood of the Schuylkill river. Westward its limit cannot be traced, as it is destroyed by erosion, but from appearances it was as great as in the east. It lies between a mass of shale above and another mass below, and at its greatest development is about 800 feet thick, at the Susquehanna gap. Some of its beds, especially toward the middle, are very hard and flinty, but it grows more and more shaly as it recedes from this point. Apparently it exists at some distance from its point of greatest development as a sandstone mass below and another above, with intervening shales.

Note on a large Crustacean from the Catskill Group of Pennsylvania. By E. W. Claypole.

(Read before the American Philosophical Society, Sept. 21, 1883.)

I have lately received from Mr. R. D. Lacoe, of Pittston, a slab of green sandstone, from the Catskill group of Wyoming county, containing a well-preserved head of some creature. Though not complete, yet enough remains to enable me to form a good idea of what the full form of the head must have been.

It measures eight and a half inches across the broadest part, and the same from front to back. The outline is semi-elliptical, the part preserved corresponding to a piece cut from one of the ends of an ellipse. It is somewhat distorted, and may when perfect have been more nearly semicircular. The outline is slightly wavy, but this also may be due to distortion. Fortunately the right side is almost perfect and, being symmetrical, it is not difficult to reconstruct the other. A good idea of its general shape may be suggested to a palæontologist by saying that it resembles the head of *Cephalaspis*.

A longitudinal median ridge runs from near the front margin almost to the back of the portion preserved, dividing the head surface into two equal parts. This ridge rose near its front end into a low tubercle, or perhaps a spine, and near its hinder end into a distinct and boldly elevated spine which is, however, crushed down almost flat. Posteriorly the ridge narrows and tapers down to the general surface.

At the place of the posterior spine another ridge, less distinct, crosses the former at right-angles, and itself rises at its two ends, midway to the outer margin, into low prominences from which two semicircular ridges, convex outwardly, run curving in toward the median line at both their ends, one in front, the other behind the cross-ridge from which they start. Each cross-ridge, with its semicircular branch, resembles in outline an